

## DURANGONELLA, A NEW HYDROBIINE GENUS FROM MEXICO, WITH THREE NEW SPECIES

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The recent discovery of a slender aquatic species of snail in Pleistocene or Post-pleistocene lake deposits in the Federal District of Mexico by Miss Marie E. Bourgeois, and the attempts to determine its taxonomic position have brought to light an undescribed generic group in the Mexican freshwater molluscan fauna.

Family Bulimidae; Subfamily Hydrobiinae.

### DURANGONELLA, new genus

Shell slender, elongate-conic, apex slightly obtuse, translucent, with smooth, slowly increasing, rounded whorls separated by a distinct, deep suture. The aperture is small, oval, a little angled above; the lip entire, usually slightly appressed to the preceding whorl above; the umbilicus small and deep. The operculum is thin, corneous, paucispiral.

Animal Hydrobiine, with short tentacles and a relatively shorter blunter snout. The male organ is large, simple (non-flagellate), attached dorsally a little behind the tentacles, a trifle to the left of the midline, and directed, in the "dried-in" material prepared and examined, about 45° dextro-posteriorly. It is much flattened, broadened distally (spatulate), with a weakly trilobed anterior-distal margin and an evenly, narrowly rounded tip. The females are ovo-viviparous; the many uterine young possessing short amnioloid shells of about 1½ whorls.

Genotype: *Durangonella seemani* (Frauenfeld) = *Hydrobia seemani* Frauenfeld.

Contrary to Dr. Stearns' opinions, there are no completely smooth examples of *Tryonia protea* known. Also, a comparison of animals of *protea* from the Salton Sea area of California, and of *seemani* from the City of Durango, Mexico, has shown too much difference to consider them congeneric any longer.

The genus *Durangonella* differs from *Tryonia* by its lack of marked sculpture and more particularly by possessing a verge of

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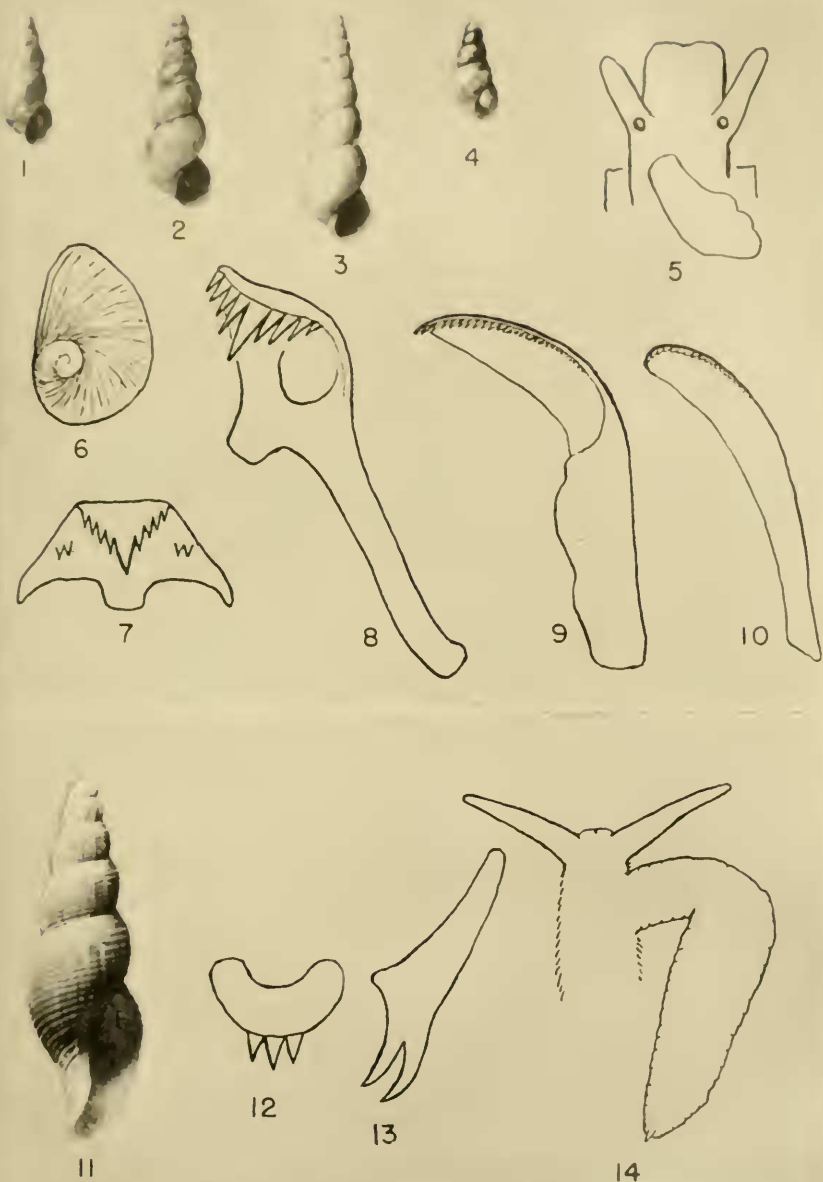


FIG. 1, *Durangonella socmani* (Frauenfeld), Topotype. 2, *Durangonella mariaev* Morrison, Holotype. 3, *Durangonella dugesiana* Morrison, Holotype. 4, *Durangonella pilsbryi* Morrison, Holotype. (All  $\times 5$ ). 5, *Durangonella socmani*, sketch of head and verge of topotype male; 6, operculum; 7-10, teeth of radula, much enlarged, from topotype female; 7, rachidian tooth; 8, lateral; 9, inner marginal; 10, outer marginal.

FIGS. 11-14. *Morrisonella pacifica* (Dall), shell, teeth, and outline of head and verge.



different pattern in male individuals. The same characteristics will also distinguish it from the smooth phase of slender species of the genus *Lyrodes*.

DURANGONELLA SEEMANI (Frauenfeld). Pl. 3, figs. 1, 5-10.

1863—*Hydrobia seemani* Frauenfeld, Verh. der K. K. Zool. Bot. Ges. Wien, 1863, p. 1025; *ibid*, 1865, p. 525, pl. 8.

1870—*Bythinella seemani* Tryon, Mon., p. 50, pl. 16, fig. 9.

1893—*Bythinella protea* Stearns (pars), N. Am. Fauna, vol. 7, pt. 2, p. 278.

1901—*Paludestrina protea* Stearns (pars), Proc. U.S.N.M., vol. 24, p. 277 (*seemani*; Durango only).

Original description: "Shell slender, conic, not acutely pointed, gray-green, translucent,  $5\frac{1}{2}$  smooth whorls, regularly increasing, rounded, suture very strongly marked. Aperture small, oval, a little angled above, lip simple, appressed to the columella above, umbilicus small, deep. Length 4 mm. Breadth 1.8 mm."

"In Cuming's collection, N.W. Mexico, Durango, Dr. Seeman."

The operculum is thin, corneous, paucispiral, of about 2 turns. The radula is minute, similar to that of *Lyrodes coronatus nicaraguanus* Ancy from Lake Izabal, Guatemala, as figured by F. C. Baker.<sup>2</sup> The radular formula is

$$\frac{4-1-4}{2} : 4-1-4 : 25 \pm : 15 \pm.$$

The cusps on the marginal teeth are so minute they are extremely difficult to count even with reasonable accuracy. The diagnostic animal characters are furnished in the generic description above from topotypes (U.S.N.M. No. 251826), collected by Dr. Edw. Palmer "in freshwater algae, from a small pond fed by a spring from which the City of Durango gets its water."

The topotype figured (U.S.N.M. No. 251826) has 6 whorls and measures: Height 3.5 mm., Diameter 1.45 mm., Aperture height 1.1 m., Aperture diameter 0.8 m.

<sup>2</sup> Freshwater Mollusca of Wis., vol. 2, p. 143, fig. 63; 1928.

*D. seemani* differs from the other known members of the genus by the smaller size of adult shells, with usually about 5 whorls. The periphery of the whorls is not evenly arched from suture to suture, as in *D. mariaae*, but shows indication of a rounded shoulder near the summit. The shell is proportionately more slender than that of *D. pilsbryi*, although of about the same size.

DURANGONELLA MARIAAE, new species. Pl. 3, fig. 2.

Shell elongate-conic, terete, vitreous, almost transparent, covered by an extremely thin, light corneous epidermis; Apex narrowly pointed; whorls slowly, regularly increasing in size and tightly coiled around the axis. Nuclear whorls smooth, post-nuclear whorls mostly smooth, sculptured by fine growth lines crossed by microscopic spiral striations. Suture distinct, sharp, with the well rounded whorls evenly arched from periphery to summit. Aperture elliptical, slightly narrowed and obtusely angled above; lip thin, entire, slightly sinuous above, slightly or not at all appressed to the penultimate whorl; umbilicus variable, a narrow chink or slit behind the upright columellar lip.

Operculum not found, apparently not preserved in these deposits. Animal not seen, but probably ovo-viviparous as in its conchological relatives. Great numbers of minute shells found with the adults indicate this possibility.

The holotype (U.S.N.M. No. 433399) was collected from the shell stratum (marl), 1 meter below the present surface of the dry bed of the lake at Tlahuac, 20 kilometers east of Xochimileo, D. F., Mexico, by Marie E. Bourgeois. It has 7 whorls and measures: Height 5.0 mm., Diameter 1.8 mm., Aperture height 1.2 mm., Aperture diameter 1.0 mm. The great majority of adult shells seen approximate the type in size; a few however are larger, the largest seen (one of many U.S.N.M. No. 433414) has 8½ whorls and measures: Length 7.5 mm., Diameter 2.6 mm., Aperture height 2.1 mm., Aperture diameter 1.5 mm.

*D. mariaae* is most closely allied to *D. seemani* (Frauenfeld) from the City of Durango, but differs from that species in being larger, longer, and in possessing more evenly rounded whorls. The related form *D. dugesiana* from Michoacan is still narrower, with the slope of the whorl above the periphery somewhat flattened.

*Durangonella mariae*, named for its discoverer, is known only from the Pleistocene or post-pleistocene lake deposits near Tlahuac. It probably became extinct when the shallow lake dried up or was filled up by the accumulated deposits. Seeds present in the peaty marl indicate that these snails lived in a habitat with species of *Potamogeton* and of *Scirpus*. The lake deposits at Tlahuac, as sampled by Miss Bourgeois, consist of a bed of black peat at a depth of 1.5 meters below the present land surface, and above this bed a gradual transition to a light grey or whitish shell marl at 1.2 meters depth. The marl at 1 meter depth is filled with shells, forming a visible "shell stratum"; it continues upward to at least a point 0.4 meter below the surface, with shells scattered through it, but not in the profusion of the well-marked "shell stratum." No shells were to be found in the peat layer at 1.5 meters depth, but there were small lime concretions and the bones and scales of small fish in this layer. These fish remains apparently indicate the presence of small fish such as are living today in other lakes in Central Mexico. The most conspicuous shell in these lake deposits is the new species, *D. mariae*; it was present in small numbers in the samples from a depth of 1.2 meters in the lower layers of the marl, was extremely abundant in the "shell stratum" at 1 meter depth, and declined in numbers again in the upper layers to uncommon occurrence in the uppermost layer of marl sampled at 0.4 meter depth.

In company with *D. mariae* in the marl deposits, but not in great numbers, were found other species of freshwater shells, namely: *Valvata humeralis* (Say), *Physella osculans* (Haldeman), *Helisoma tenue chapalense* Pilsbry, *Gyraulus parvus* (Say)?, *Ferrissia* species, *Musculium subtransversum* (Prime), and *Pisidium* species. Another marl sample collected by Miss Bourgeois from the "shell stratum" at a point 1 kilometer distant and 1.8 meters from the surface, yielded *Durangonella mariae* in abundance, *Helisoma tenue chapalense* Pilsbry, and numbers of *Physella osculans* (Haldeman).

DURANGONELLA DUGESIANA, new species. Pl. 3, fig. 3.

Shell elongate-conic, terete, opaque white (in specimens examined), apex narrowly pointed, the whorls very tightly coiled,